FIG. 1

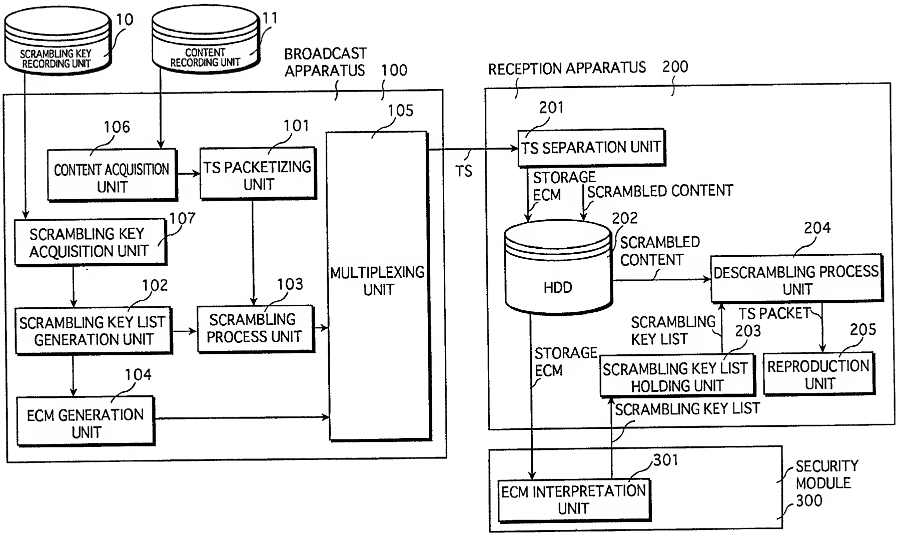

SCRAMBLING KEY RECORDING UNIT
10
CONTENT RECORDING UNIT
11
BROADCAST APPARATUS
100
106
CONTENT ACQUISITION UNIT
101
TS PACKETIZING UNIT
105
MULTIPLEXING UNIT
107
SCRAMBLING KEY ACQUISITION UNIT
102
SCRAMBLING KEY LIST GENERATION UNIT
103
SCRAMBLING PROCESS UNIT
104
ECM GENERATION UNIT
TS
RECEPTION APPARATUS
200
201
TS SEPARATION UNIT
STORAGE ECM
SCRAMBLED CONTENT
202
HDD
SCRAMBLED CONTENT
204
DESCRAMBLING PROCESS UNIT
TS PACKET
SCRAMBLING KEY LIST
203
SCRAMBLING KEY LIST HOLDING UNIT
205
REPRODUCTION UNIT
STORAGE ECM
SCRAMBLING KEY LIST
301
ECM INTERPRETATION UNIT
SECURITY MODULE
300

FIG. 2

DATA STRUCTURE OF SCRAMBLING KEY LIST DESCRIPTOR

```
CA_Ks_List_descriptor() {
        descriptor_tag              1 BYTE
        descriptor_length           1 BYTE
        for(i=0; i <N; i++) {
          Ks_id                     1 BYTE
          TS_packet_number          2 BYTES
          Ks                        8 BYTES
        }
  }
```

Ks_id	:SCRAMBLING KEY IDENTIFIER (TO IDENTIFY SCRAMBLING KEYS)
TS_packet_number	:THE NUMBER OF TS PACKETS SCRAMBLED WITH THE Ks
Ks	:SCRAMBLING KEY

FIG. 3

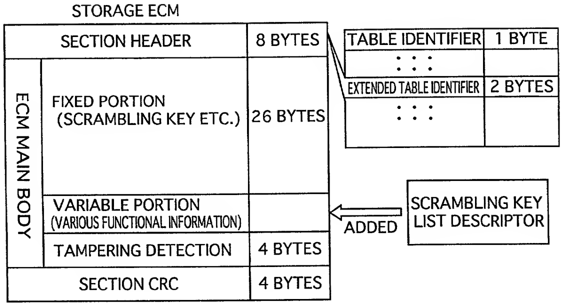

STORAGE ECM
SECTION HEADER
8 BYTES
ECM MAIN BODY
FIXED PORTION
(SCRAMBLING KEY ETC.)
26 BYTES
VARIABLE PORTION
(VARIOUS FUNCTIONAL INFORMATION)
TAMPERING DETECTION
4 BYTES
SECTION CRC
4 BYTES
TABLE IDENTIFIER
1 BYTE
EXTENDED TABLE IDENTIFIER
2 BYTES
ADDED
SCRAMBLING KEY
LIST DESCRIPTOR

FIG. 4

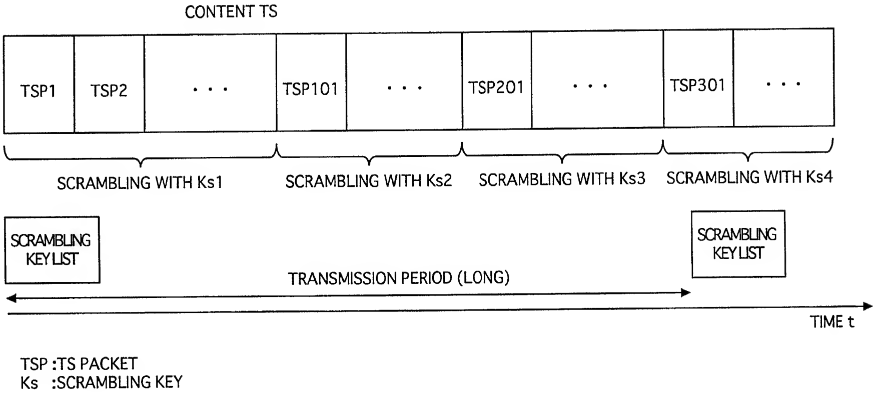

CONTENT TS
TSP1
TSP2
. . .
TSP101
. . .
TSP201
. . .
TSP301
. . .
SCRAMBLING WITH Ks1
SCRAMBLING WITH Ks2
SCRAMBLING WITH Ks3
SCRAMBLING WITH Ks4
SCRAMBLING KEY LIST
TRANSMISSION PERIOD (LONG)
SCRAMBLING KEY LIST
TIME t
TSP :TS PACKET
Ks :SCRAMBLING KEY

FIG. 5

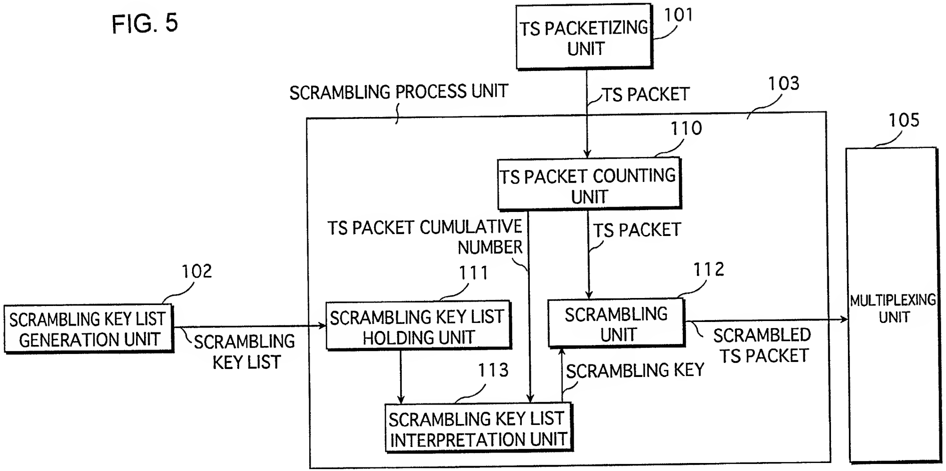
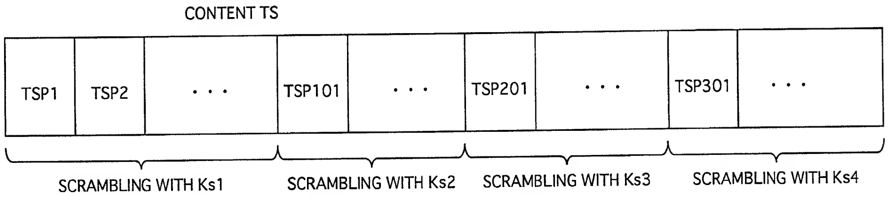

TS PACKETIZING UNIT
101
TS PACKET
SCRAMBLING PROCESS UNIT
103
110
TS PACKET COUNTING UNIT
105
TS PACKET CUMULATIVE NUMBER
TS PACKET
102
111
112
SCRAMBLING KEY LIST GENERATION UNIT
SCRAMBLING KEY LIST
SCRAMBLING KEY LIST HOLDING UNIT
SCRAMBLING UNIT
SCRAMBLED TS PACKET
MULTIPLEXING UNIT
113
SCRAMBLING KEY
SCRAMBLING KEY LIST INTERPRETATION UNIT

FIG. 6



TSP :TS PACKET
Ks :SCRAMBLING KEY

FIG. 7

SCRAMBLING KEY LIST

Ks_id TS_packet_number Ks	1 100 Ks 1
Ks_id TS_packet_number Ks	2 100 Ks 2
Ks_id TS_packet_number Ks	3 100 Ks 3
Ks_id TS_packet_number Ks	4 100 Ks 4

FIG. 8

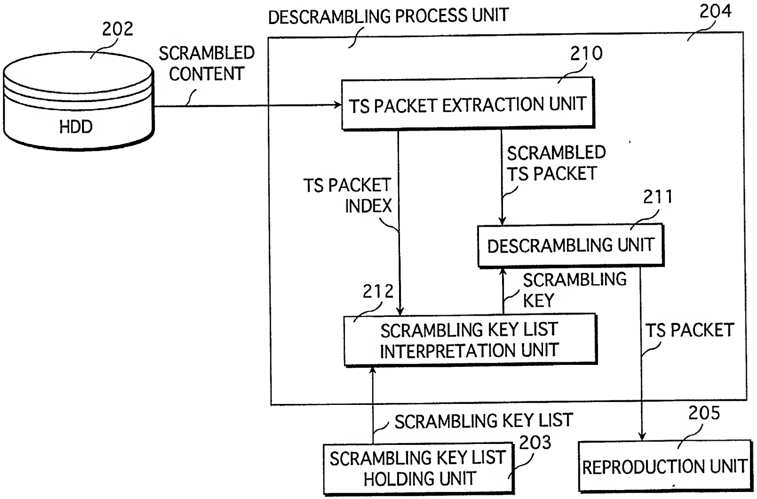

202
HDD
SCRAMBLED CONTENT
DESCRAMBLING PROCESS UNIT
204
210
TS PACKET EXTRACTION UNIT
TS PACKET INDEX
SCRAMBLED TS PACKET
211
DESCRAMBLING UNIT
SCRAMBLING KEY
212
SCRAMBLING KEY LIST INTERPRETATION UNIT
TS PACKET
SCRAMBLING KEY LIST
203
SCRAMBLING KEY LIST HOLDING UNIT
205
REPRODUCTION UNIT

FIG. 9

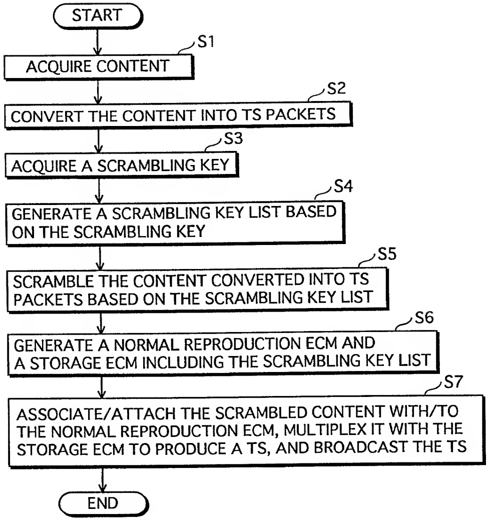

START
S1
ACQUIRE CONTENT
S2
CONVERT THE CONTENT INTO TS PACKETS
S3
ACQUIRE A SCRAMBLING KEY
S4
GENERATE A SCRAMBLING KEY LIST BASED ON THE SCRAMBLING KEY
S5
SCRAMBLE THE CONTENT CONVERTED INTO TS PACKETS BASED ON THE SCRAMBLING KEY LIST
S6
GENERATE A NORMAL REPRODUCTION ECM AND A STORAGE ECM INCLUDING THE SCRAMBLING KEY LIST
S7
ASSOCIATE/ATTACH THE SCRAMBLED CONTENT WITH/TO THE NORMAL REPRODUCTION ECM, MULTIPLEX IT WITH THE STORAGE ECM TO PRODUCE A TS, AND BROADCAST THE TS
END

FIG. 10

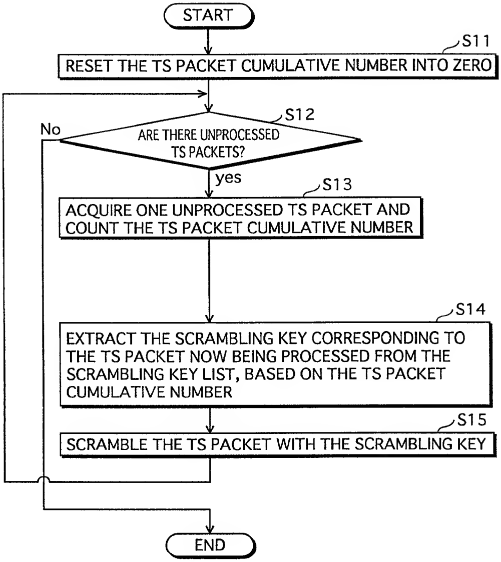

START
S11
RESET THE TS PACKET CUMULATIVE NUMBER INTO ZERO
S12
No
ARE THERE UNPROCESSED TS PACKETS?
yes
S13
ACQUIRE ONE UNPROCESSED TS PACKET AND COUNT THE TS PACKET CUMULATIVE NUMBER
S14
EXTRACT THE SCRAMBLING KEY CORRESPONDING TO THE TS PACKET NOW BEING PROCESSED FROM THE SCRAMBLING KEY LIST, BASED ON THE TS PACKET CUMULATIVE NUMBER
S15
SCRAMBLE THE TS PACKET WITH THE SCRAMBLING KEY
END

FIG. 11

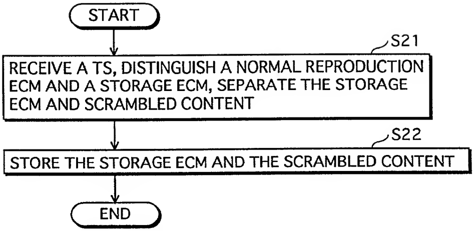

START
S21
RECEIVE A TS, DISTINGUISH A NORMAL REPRODUCTION ECM AND A STORAGE ECM, SEPARATE THE STORAGE ECM AND SCRAMBLED CONTENT
S22
STORE THE STORAGE ECM AND THE SCRAMBLED CONTENT
END

FIG. 12

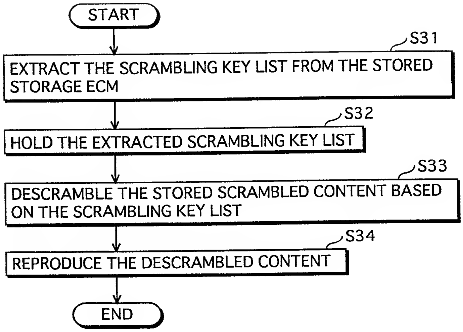

START
S31
EXTRACT THE SCRAMBLING KEY LIST FROM THE STORED STORAGE ECM
S32
HOLD THE EXTRACTED SCRAMBLING KEY LIST
S33
DESCRAMBLE THE STORED SCRAMBLED CONTENT BASED ON THE SCRAMBLING KEY LIST
S34
REPRODUCE THE DESCRAMBLED CONTENT
END

FIG. 13

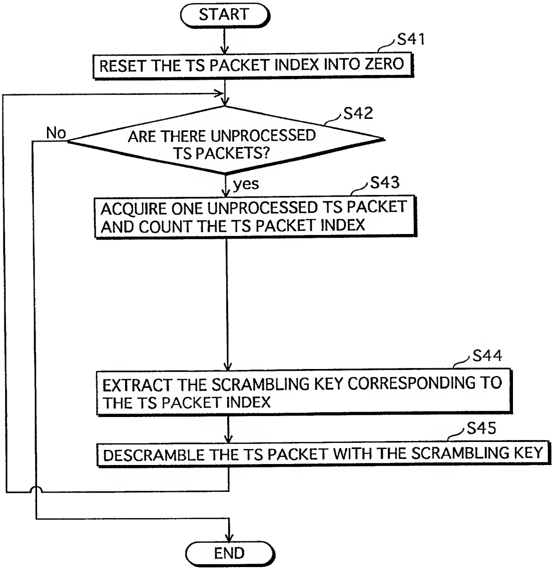

START
S41
RESET THE TS PACKET INDEX INTO ZERO
S42
ARE THERE UNPROCESSED TS PACKETS?
No
yes
S43
ACQUIRE ONE UNPROCESSED TS PACKET AND COUNT THE TS PACKET INDEX
S44
EXTRACT THE SCRAMBLING KEY CORRESPONDING TO THE TS PACKET INDEX
S45
DESCRAMBLE THE TS PACKET WITH THE SCRAMBLING KEY
END

FIG. 14

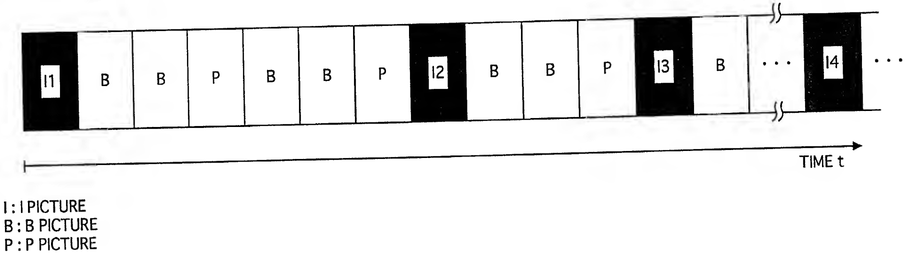
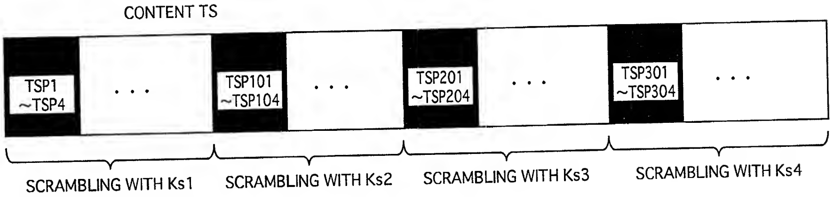

I1
B
B
P
B
B
P
I2
B
B
P
I3
B
. . .
I4
. . .
TIME t
I : I PICTURE
B : B PICTURE
P : P PICTURE

FIG. 15



TSP :TS PACKET
Ks :SCRAMBLING KEY

FIG. 16

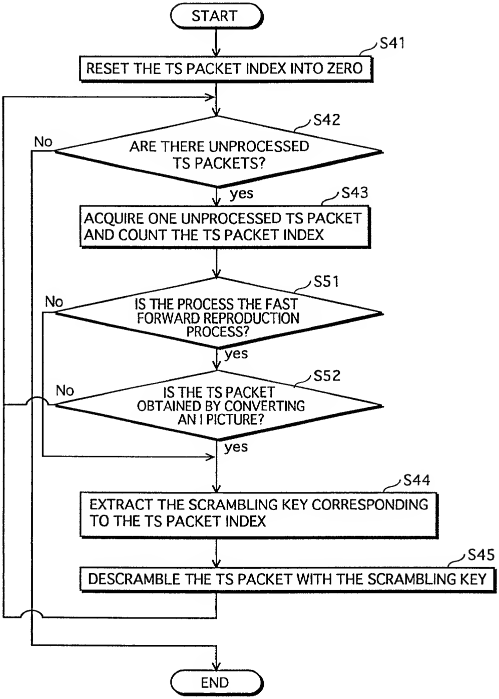

START
S41
RESET THE TS PACKET INDEX INTO ZERO
S42
ARE THERE UNPROCESSED TS PACKETS?
No
yes
S43
ACQUIRE ONE UNPROCESSED TS PACKET AND COUNT THE TS PACKET INDEX
S51
IS THE PROCESS THE FAST FORWARD REPRODUCTION PROCESS?
No
yes
S52
IS THE TS PACKET OBTAINED BY CONVERTING AN I PICTURE?
No
yes
S44
EXTRACT THE SCRAMBLING KEY CORRESPONDING TO THE TS PACKET INDEX
S45
DESCRAMBLE THE TS PACKET WITH THE SCRAMBLING KEY
END

FIG. 17

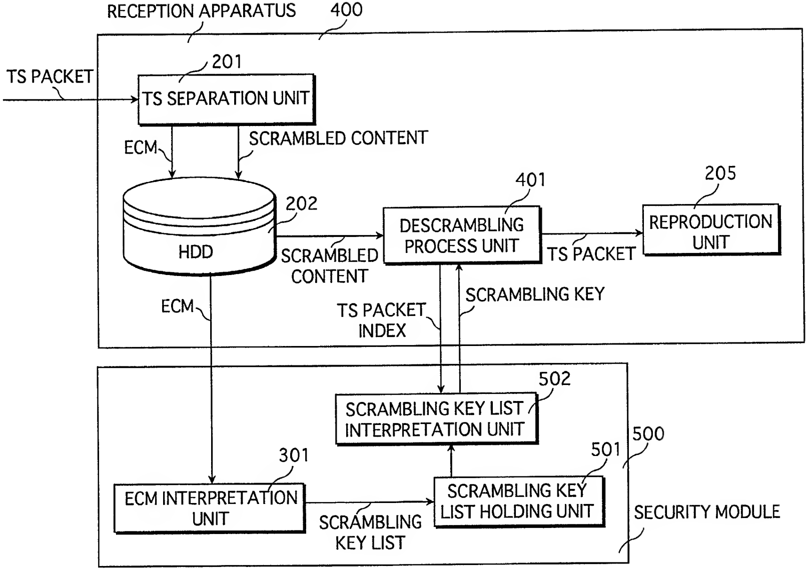

RECEPTION APPARATUS
400
TS PACKET
201
TS SEPARATION UNIT
ECM
SCRAMBLED CONTENT
202
HDD
SCRAMBLED CONTENT
401
DESCRAMBLING PROCESS UNIT
TS PACKET
205
REPRODUCTION UNIT
ECM
TS PACKET INDEX
SCRAMBLING KEY
502
SCRAMBLING KEY LIST INTERPRETATION UNIT
500
501
301
ECM INTERPRETATION UNIT
SCRAMBLING KEY LIST
SCRAMBLING KEY LIST HOLDING UNIT
SECURITY MODULE

FIG. 18

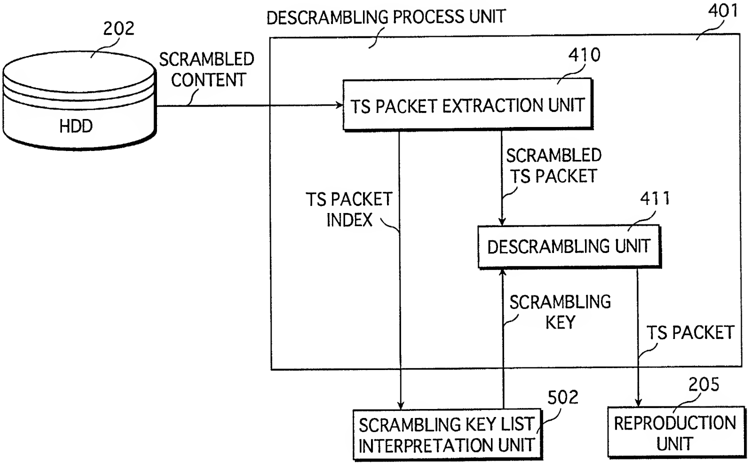
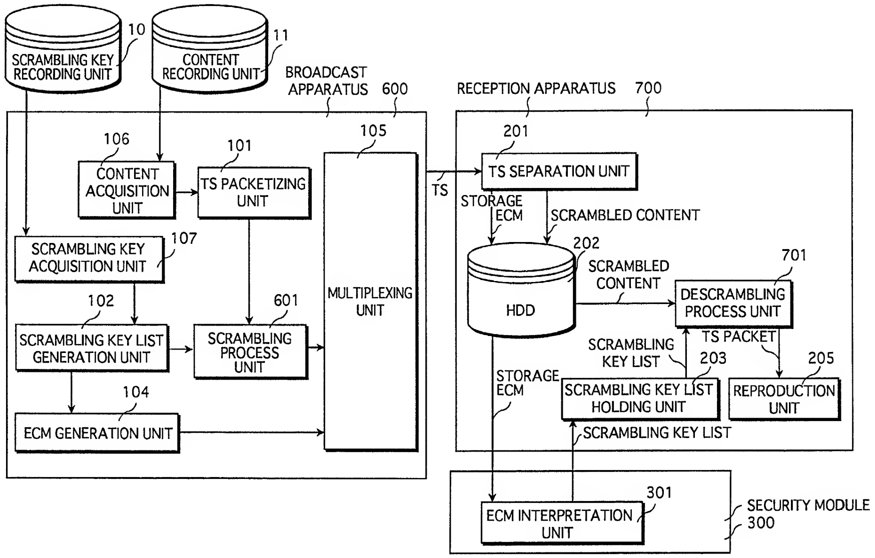

202
HDD
SCRAMBLED CONTENT
DESCRAMBLING PROCESS UNIT
401
410
TS PACKET EXTRACTION UNIT
SCRAMBLED TS PACKET
TS PACKET INDEX
411
DESCRAMBLING UNIT
SCRAMBLING KEY
TS PACKET
502
SCRAMBLING KEY LIST INTERPRETATION UNIT
205
REPRODUCTION UNIT

FIG. 19



SCRAMBLING KEY RECORDING UNIT
10
CONTENT RECORDING UNIT
11
BROADCAST APPARATUS
600
106
CONTENT ACQUISITION UNIT
101
TS PACKETIZING UNIT
105
MULTIPLEXING UNIT
SCRAMBLING KEY ACQUISITION UNIT
107
102
SCRAMBLING KEY LIST GENERATION UNIT
601
SCRAMBLING PROCESS UNIT
104
ECM GENERATION UNIT
TS
RECEPTION APPARATUS
700
201
TS SEPARATION UNIT
STORAGE ECM
SCRAMBLED CONTENT
202
HDD
SCRAMBLED CONTENT
701
DESCRAMBLING PROCESS UNIT
TS PACKET
SCRAMBLING KEY LIST
203
205
STORAGE ECM
SCRAMBLING KEY LIST HOLDING UNIT
REPRODUCTION UNIT
SCRAMBLING KEY LIST
301
ECM INTERPRETATION UNIT
SECURITY MODULE
300

FIG. 20

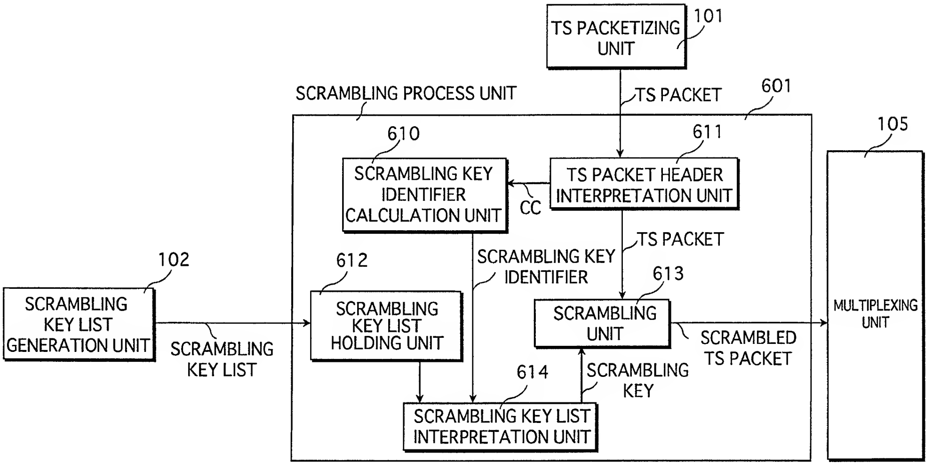

TS PACKETIZING UNIT
101
SCRAMBLING PROCESS UNIT
TS PACKET
601
610
611
105
SCRAMBLING KEY IDENTIFIER CALCULATION UNIT
CC
TS PACKET HEADER INTERPRETATION UNIT
TS PACKET
102
612
SCRAMBLING KEY IDENTIFIER
613
SCRAMBLING KEY LIST GENERATION UNIT
SCRAMBLING KEY LIST HOLDING UNIT
SCRAMBLING UNIT
MULTIPLEXING UNIT
SCRAMBLING KEY LIST
SCRAMBLED TS PACKET
614
SCRAMBLING KEY
SCRAMBLING KEY LIST INTERPRETATION UNIT

FIG. 21

SCRAMBLING KEY LIST

Ks_id	0
Ks	Ks 1
Ks_id	1
Ks	Ks 2
Ks_id	2
Ks	Ks 3
Ks_id	3
Ks	Ks 4
Ks_id	4
Ks	Ks 5
Ks_id	5
Ks	Ks 6
Ks_id	6
Ks	Ks 7
Ks_id	7
Ks	Ks 8
Ks_id	8
Ks	Ks 9
Ks_id	9
Ks	Ks 10
Ks_id	10
Ks	Ks 11
Ks_id	11
Ks	Ks 12
Ks_id	12
Ks	Ks 13
Ks_id	13
Ks	Ks 14
Ks_id	14
Ks	Ks 15
Ks_id	15
Ks	Ks 16

FIG. 22

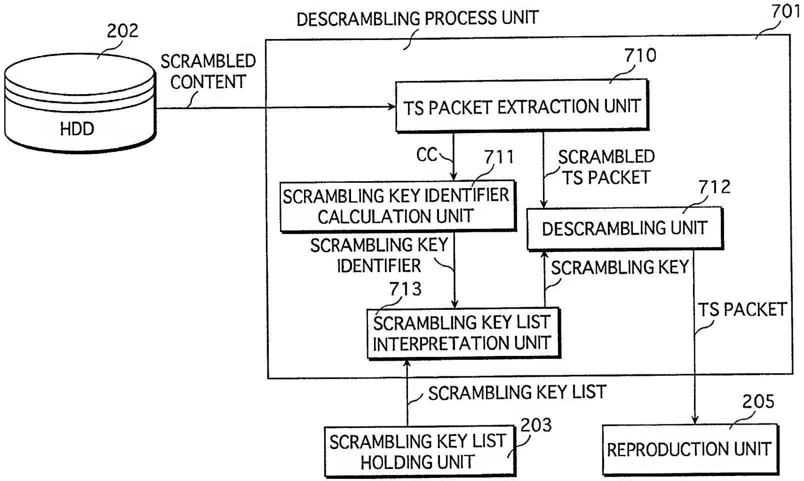

202
HDD
SCRAMBLED CONTENT
DESCRAMBLING PROCESS UNIT
701
710
TS PACKET EXTRACTION UNIT
CC
711
SCRAMBLED TS PACKET
SCRAMBLING KEY IDENTIFIER CALCULATION UNIT
712
DESCRAMBLING UNIT
SCRAMBLING KEY IDENTIFIER
SCRAMBLING KEY
713
SCRAMBLING KEY LIST INTERPRETATION UNIT
TS PACKET
SCRAMBLING KEY LIST
203
SCRAMBLING KEY LIST HOLDING UNIT
205
REPRODUCTION UNIT

FIG. 23

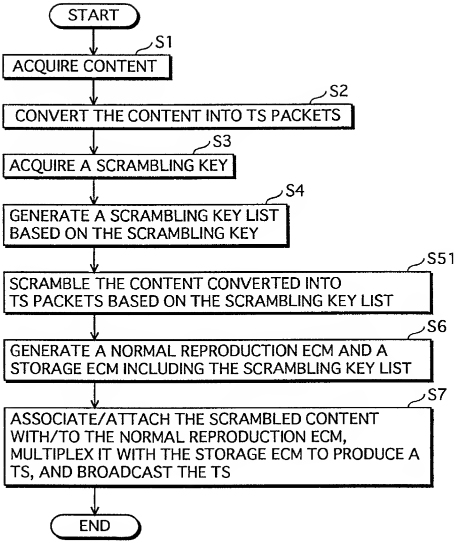
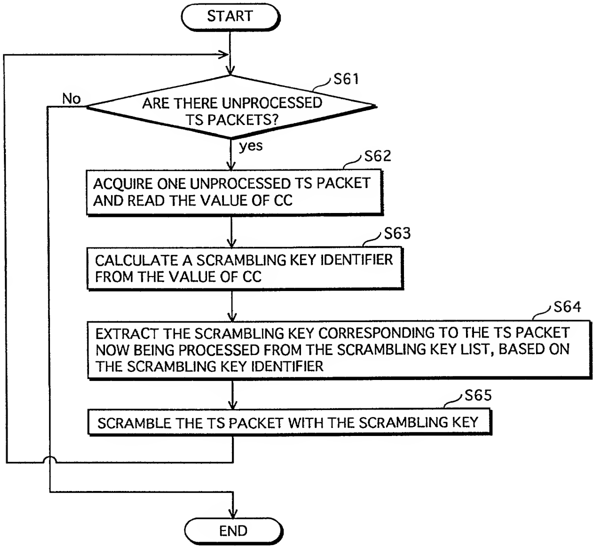

START
S1
ACQUIRE CONTENT
S2
CONVERT THE CONTENT INTO TS PACKETS
S3
ACQUIRE A SCRAMBLING KEY
S4
GENERATE A SCRAMBLING KEY LIST BASED ON THE SCRAMBLING KEY
S51
SCRAMBLE THE CONTENT CONVERTED INTO TS PACKETS BASED ON THE SCRAMBLING KEY LIST
S6
GENERATE A NORMAL REPRODUCTION ECM AND A STORAGE ECM INCLUDING THE SCRAMBLING KEY LIST
S7
ASSOCIATE/ATTACH THE SCRAMBLED CONTENT WITH/TO THE NORMAL REPRODUCTION ECM, MULTIPLEX IT WITH THE STORAGE ECM TO PRODUCE A TS, AND BROADCAST THE TS
END

FIG. 24



START
S61
ARE THERE UNPROCESSED TS PACKETS?
No
yes
S62
ACQUIRE ONE UNPROCESSED TS PACKET AND READ THE VALUE OF CC
S63
CALCULATE A SCRAMBLING KEY IDENTIFIER FROM THE VALUE OF CC
S64
EXTRACT THE SCRAMBLING KEY CORRESPONDING TO THE TS PACKET NOW BEING PROCESSED FROM THE SCRAMBLING KEY LIST, BASED ON THE SCRAMBLING KEY IDENTIFIER
S65
SCRAMBLE THE TS PACKET WITH THE SCRAMBLING KEY
END

FIG. 25

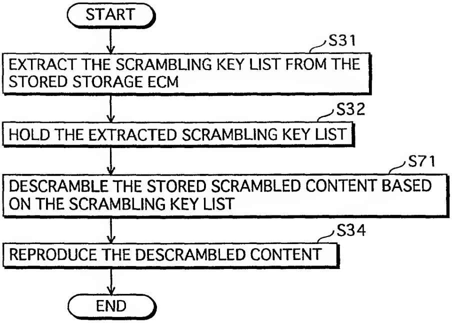

START
S31
EXTRACT THE SCRAMBLING KEY LIST FROM THE STORED STORAGE ECM
S32
HOLD THE EXTRACTED SCRAMBLING KEY LIST
S71
DESCRAMBLE THE STORED SCRAMBLED CONTENT BASED ON THE SCRAMBLING KEY LIST
S34
REPRODUCE THE DESCRAMBLED CONTENT
END

FIG. 26

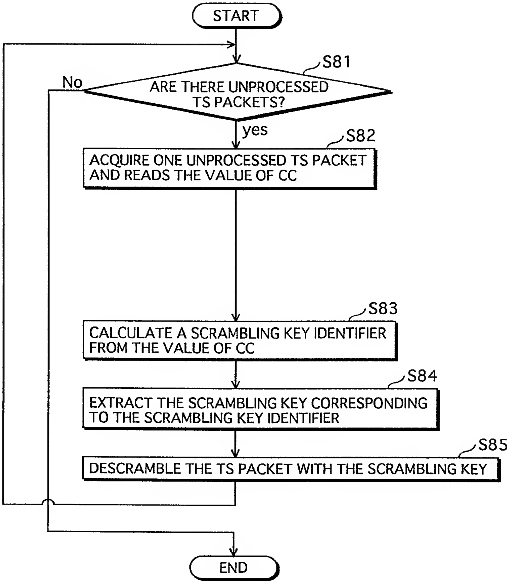

START
S81
No
ARE THERE UNPROCESSED TS PACKETS?
yes
S82
ACQUIRE ONE UNPROCESSED TS PACKET AND READS THE VALUE OF CC
S83
CALCULATE A SCRAMBLING KEY IDENTIFIER FROM THE VALUE OF CC
S84
EXTRACT THE SCRAMBLING KEY CORRESPONDING TO THE SCRAMBLING KEY IDENTIFIER
S85
DESCRAMBLE THE TS PACKET WITH THE SCRAMBLING KEY
END

FIG. 27

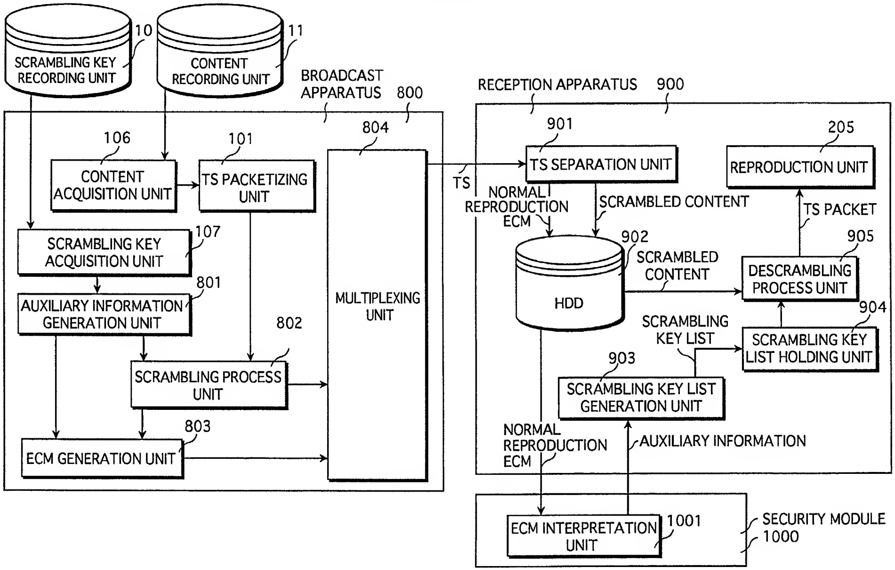

SCRAMBLING KEY RECORDING UNIT
10
CONTENT RECORDING UNIT
11
BROADCAST APPARATUS
800
RECEPTION APPARATUS
900
106
CONTENT ACQUISITION UNIT
101
TS PACKETIZING UNIT
804
MULTIPLEXING UNIT
SCRAMBLING KEY ACQUISITION UNIT
107
801
AUXILIARY INFORMATION GENERATION UNIT
802
SCRAMBLING PROCESS UNIT
803
ECM GENERATION UNIT
TS
901
TS SEPARATION UNIT
205
REPRODUCTION UNIT
NORMAL REPRODUCTION ECM
SCRAMBLED CONTENT
TS PACKET
902
SCRAMBLED CONTENT
905
DESCRAMBLING PROCESS UNIT
HDD
904
SCRAMBLING KEY LIST
SCRAMBLING KEY LIST HOLDING UNIT
903
SCRAMBLING KEY LIST GENERATION UNIT
NORMAL REPRODUCTION ECM
AUXILIARY INFORMATION
ECM INTERPRETATION UNIT
1001
SECURITY MODULE
1000

FIG. 28

DATA STRUCTURE OF SCRAMBLING KEY LIST GENERATION DESCRIPTOR

CA_Ks_ListInfo_descriptor() {	
descriptor_tag	1 BYTE
descriptor_length	1 BYTE
Ks_id	1 BYTE
TS_packet_number	2 BYTES
Ks	8 BYTES
}	

Ks_id :SCRAMBLING KEY IDENTIFIER
(TO IDENTIFY SCRAMBLING KEYS)

TS_packet_number :THE NUMBER OF TS PACKETS SCRAMBLED
WITH THE Ks

Ks :SCRAMBLING KEY

FIG. 29

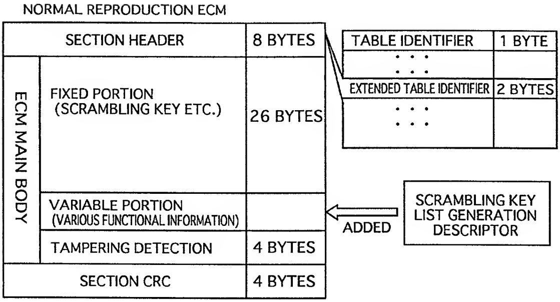

NORMAL REPRODUCTION ECM
SECTION HEADER
8 BYTES
ECM MAIN BODY
FIXED PORTION
(SCRAMBLING KEY ETC.)
26 BYTES
VARIABLE PORTION
(VARIOUS FUNCTIONAL INFORMATION)
TAMPERING DETECTION
4 BYTES
SECTION CRC
4 BYTES
TABLE IDENTIFIER
1 BYTE
EXTENDED TABLE IDENTIFIER
2 BYTES
ADDED
SCRAMBLING KEY LIST GENERATION DESCRIPTOR

FIG. 30

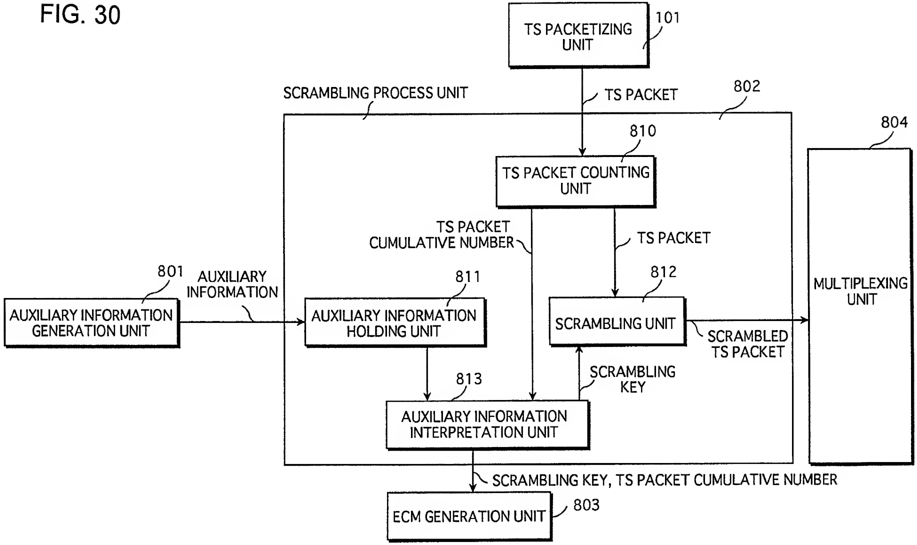

TS PACKETIZING UNIT
101
TS PACKET
SCRAMBLING PROCESS UNIT
802
810
TS PACKET COUNTING UNIT
804
TS PACKET CUMULATIVE NUMBER
TS PACKET
801
AUXILIARY INFORMATION
811
812
MULTIPLEXING UNIT
AUXILIARY INFORMATION GENERATION UNIT
AUXILIARY INFORMATION HOLDING UNIT
SCRAMBLING UNIT
SCRAMBLED TS PACKET
SCRAMBLING KEY
813
AUXILIARY INFORMATION INTERPRETATION UNIT
SCRAMBLING KEY, TS PACKET CUMULATIVE NUMBER
ECM GENERATION UNIT
803

FIG. 31

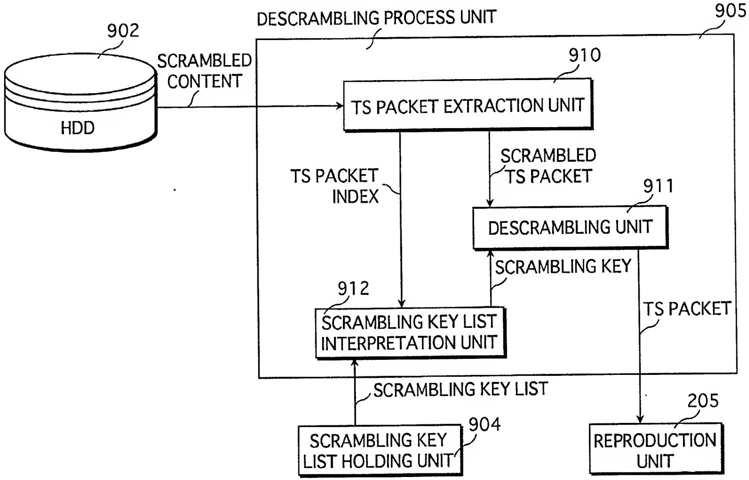

DESCRAMBLING PROCESS UNIT
905
902
HDD
SCRAMBLED CONTENT
910
TS PACKET EXTRACTION UNIT
TS PACKET INDEX
SCRAMBLED TS PACKET
911
DESCRAMBLING UNIT
SCRAMBLING KEY
912
SCRAMBLING KEY LIST INTERPRETATION UNIT
TS PACKET
SCRAMBLING KEY LIST
904
SCRAMBLING KEY LIST HOLDING UNIT
205
REPRODUCTION UNIT

FIG. 32

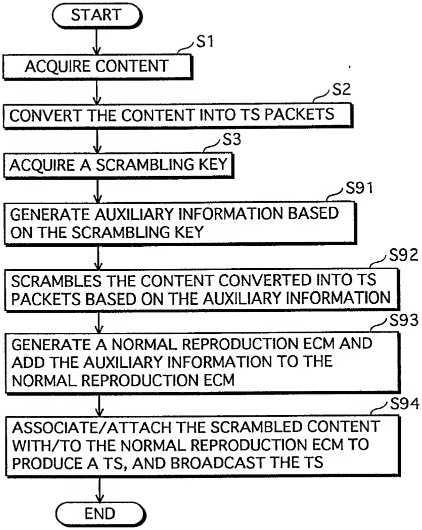

START
S1
ACQUIRE CONTENT
S2
CONVERT THE CONTENT INTO TS PACKETS
S3
ACQUIRE A SCRAMBLING KEY
S91
GENERATE AUXILIARY INFORMATION BASED ON THE SCRAMBLING KEY
S92
SCRAMBLES THE CONTENT CONVERTED INTO TS PACKETS BASED ON THE AUXILIARY INFORMATION
S93
GENERATE A NORMAL REPRODUCTION ECM AND ADD THE AUXILIARY INFORMATION TO THE NORMAL REPRODUCTION ECM
S94
ASSOCIATE/ATTACH THE SCRAMBLED CONTENT WITH/TO THE NORMAL REPRODUCTION ECM TO PRODUCE A TS, AND BROADCAST THE TS
END

FIG. 33

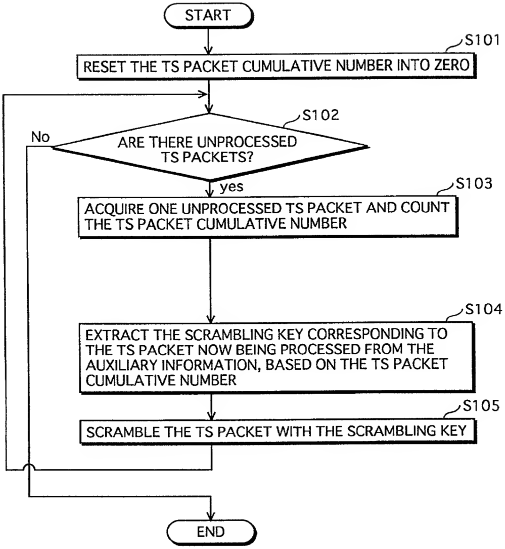

START
S101
RESET THE TS PACKET CUMULATIVE NUMBER INTO ZERO
S102
ARE THERE UNPROCESSED TS PACKETS?
No
yes
S103
ACQUIRE ONE UNPROCESSED TS PACKET AND COUNT THE TS PACKET CUMULATIVE NUMBER
S104
EXTRACT THE SCRAMBLING KEY CORRESPONDING TO THE TS PACKET NOW BEING PROCESSED FROM THE AUXILIARY INFORMATION, BASED ON THE TS PACKET CUMULATIVE NUMBER
S105
SCRAMBLE THE TS PACKET WITH THE SCRAMBLING KEY
END

FIG. 34

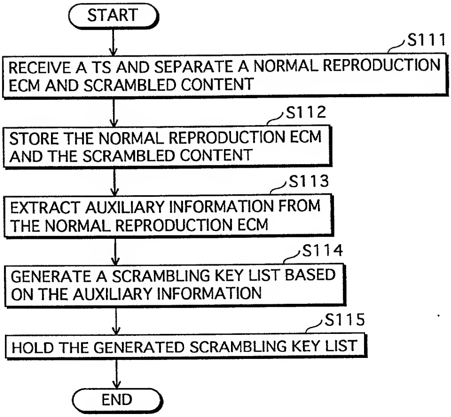

START
S111
RECEIVE A TS AND SEPARATE A NORMAL REPRODUCTION ECM AND SCRAMBLED CONTENT
S112
STORE THE NORMAL REPRODUCTION ECM AND THE SCRAMBLED CONTENT
S113
EXTRACT AUXILIARY INFORMATION FROM THE NORMAL REPRODUCTION ECM
S114
GENERATE A SCRAMBLING KEY LIST BASED ON THE AUXILIARY INFORMATION
S115
HOLD THE GENERATED SCRAMBLING KEY LIST
END

FIG. 35

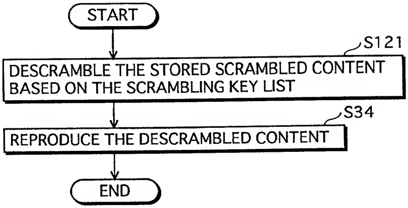

START
S121
DESCRAMBLE THE STORED SCRAMBLED CONTENT BASED ON THE SCRAMBLING KEY LIST
S34
REPRODUCE THE DESCRAMBLED CONTENT
END

FIG. 36

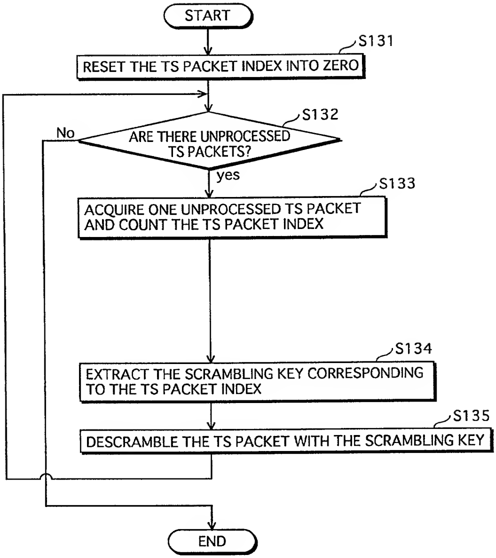

START
S131
RESET THE TS PACKET INDEX INTO ZERO
S132
No
ARE THERE UNPROCESSED TS PACKETS?
yes
S133
ACQUIRE ONE UNPROCESSED TS PACKET AND COUNT THE TS PACKET INDEX
S134
EXTRACT THE SCRAMBLING KEY CORRESPONDING TO THE TS PACKET INDEX
S135
DESCRAMBLE THE TS PACKET WITH THE SCRAMBLING KEY
END

FIG. 37

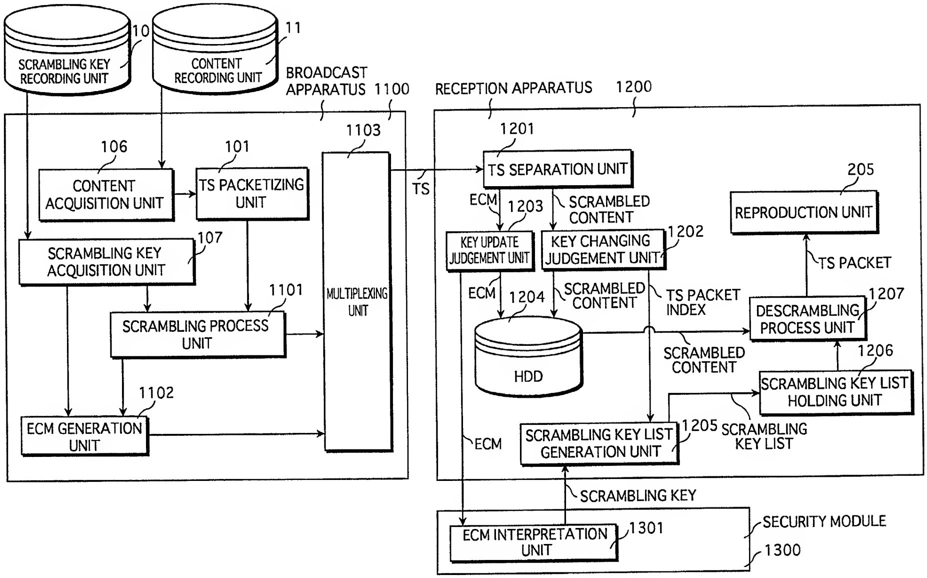

10
SCRAMBLING KEY RECORDING UNIT
11
CONTENT RECORDING UNIT
BROADCAST APPARATUS
1100
106
CONTENT ACQUISITION UNIT
101
TS PACKETIZING UNIT
1103
MULTIPLEXING UNIT
107
SCRAMBLING KEY ACQUISITION UNIT
1101
SCRAMBLING PROCESS UNIT
1102
ECM GENERATION UNIT
TS
RECEPTION APPARATUS
1200
1201
TS SEPARATION UNIT
ECM
1203
SCRAMBLED CONTENT
KEY UPDATE JUDGEMENT UNIT
KEY CHANGING JUDGEMENT UNIT
1202
ECM
1204
SCRAMBLED CONTENT
TS PACKET INDEX
HDD
SCRAMBLED CONTENT
205
REPRODUCTION UNIT
TS PACKET
1207
DESCRAMBLING PROCESS UNIT
1206
SCRAMBLING KEY LIST HOLDING UNIT
1205
SCRAMBLING KEY LIST
SCRAMBLING KEY LIST GENERATION UNIT
ECM
SCRAMBLING KEY
ECM INTERPRETATION UNIT
1301
SECURITY MODULE
1300

FIG. 38

- SCRAMBLING KEYS ARE CLASSIFIED INTO ODD NUMBER KEYS AND EVEN NUMBER KEYS.
- ONE ECM TRANSMITS BOTH OF THE ODD NUMBER KEY AND THE EVEN NUMBER KEY.
- WHEN UPDATING ECM, EITHER ODD NUMBER KEY OR EVEN NUMBER KEY IS UPDATED.

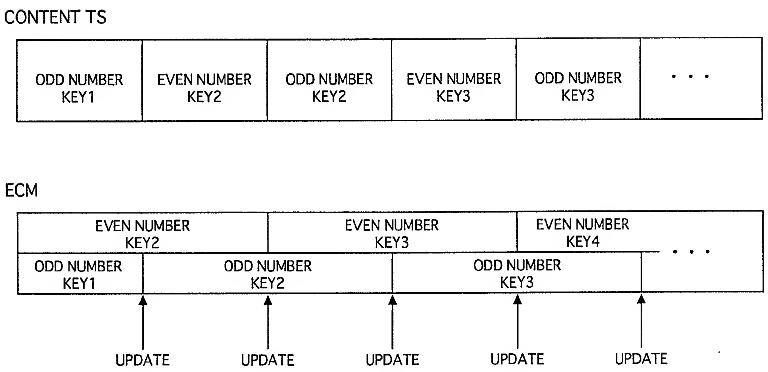
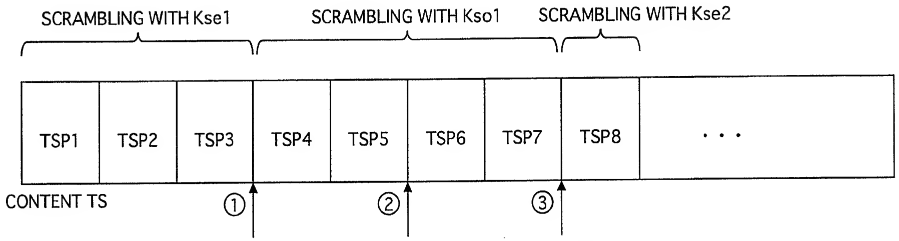


FIG. 39



CHANGING Ks FROM even TO odd (JUDGING BY THE SCRAMBLING CONTROL FLAG IN THE TSP HEADER)

ECM UPDATE (JUDGING BY THE VERSION NO. OF ECM)
Kse1 CHANGES TO Kse2 (Kso1 REMAINS AS IT IS)

CHANGING Ks FROM odd TO even (JUDGING BY THE SCRAMBLING CONTROL FLAG IN THE TSP HEADER)

TSP : TS PACKET
Ks : SCRAMBLING KEY
Kse : SCRAMBLING KEY (EVEN NUMBER KEY)
Kso : SCRAMBLING KEY (ODD NUMBER KEY)

SCRAMBLING CONTROL FLAG

SCRAMBLING FLAG VALUE	DESCRIPTION
00	NOT SCRAMBLED
01	NO DEFINITION
10	SCRAMBLED (EVEN NUMBER KEY)
11	SCRAMBLED (ODD NUMBER KEY)

FIG. 40

SCRAMBLING KEY LIST AT THE TIMING OF ① IN FIG. 39

Ks_id TS_packet_number Ks	1 3 Kse 1
Ks_id TS_packet_number Ks	2 Kso 1

UNDERLINED INFORMATION IS ADDED.

SCRAMBLING KEY LIST AT THE TIMING OF ③ IN FIG. 39

Ks_id TS_packet_number Ks	1 3 Kse 1
Ks_id TS_packet_number Ks	2 4 Kso 1
Ks_id TS_packet_number Ks	3 Kse 2

AT THE TIMING OF ② IN FIG. 39, THE SCRAMBLING KEY LIST IS NOT UPDATED, BUT STORED ECM CHANGES AS FOLLOWS.

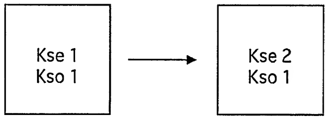
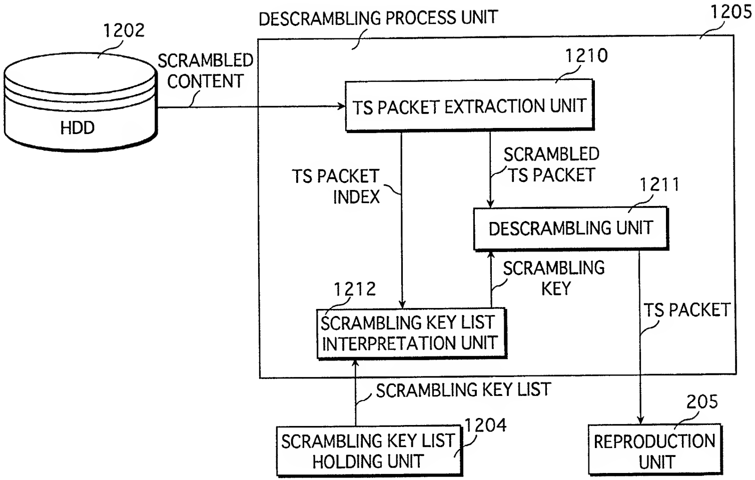


FIG. 41



DESCRAMBLING PROCESS UNIT
1205
1202
HDD
SCRAMBLED
CONTENT
1210
TS PACKET EXTRACTION UNIT
TS PACKET
INDEX
SCRAMBLED
TS PACKET
1211
DESCRAMBLING UNIT
SCRAMBLING
KEY
1212
SCRAMBLING KEY LIST
INTERPRETATION UNIT
TS PACKET
SCRAMBLING KEY LIST
1204
SCRAMBLING KEY LIST
HOLDING UNIT
205
REPRODUCTION
UNIT

FIG. 42

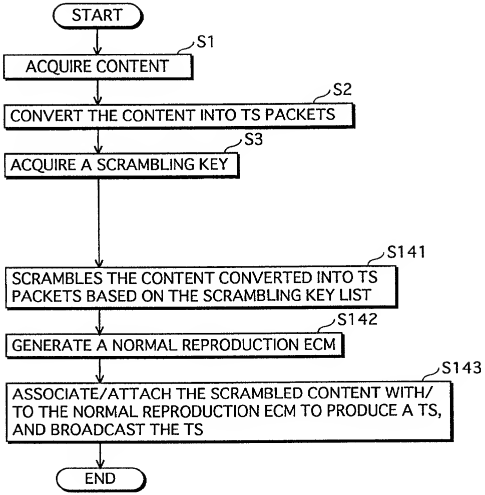

START
S1
ACQUIRE CONTENT
S2
CONVERT THE CONTENT INTO TS PACKETS
S3
ACQUIRE A SCRAMBLING KEY
S141
SCRAMBLES THE CONTENT CONVERTED INTO TS PACKETS BASED ON THE SCRAMBLING KEY LIST
S142
GENERATE A NORMAL REPRODUCTION ECM
S143
ASSOCIATE/ATTACH THE SCRAMBLED CONTENT WITH/ TO THE NORMAL REPRODUCTION ECM TO PRODUCE A TS, AND BROADCAST THE TS
END

FIG. 43

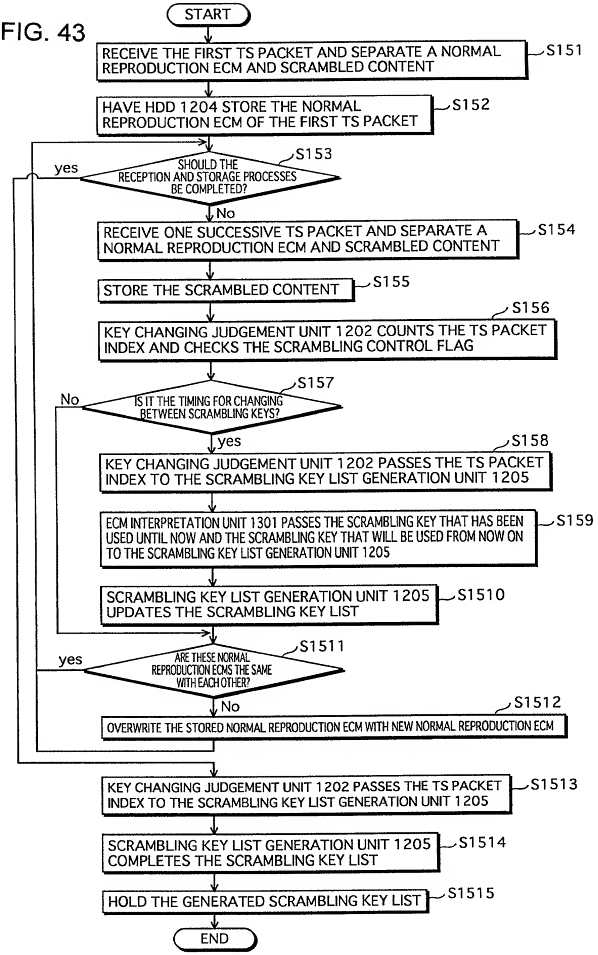

START
RECEIVE THE FIRST TS PACKET AND SEPARATE A NORMAL REPRODUCTION ECM AND SCRAMBLED CONTENT
S151
HAVE HDD 1204 STORE THE NORMAL REPRODUCTION ECM OF THE FIRST TS PACKET
S152
SHOULD THE RECEPTION AND STORAGE PROCESSES BE COMPLETED?
S153
yes
No
RECEIVE ONE SUCCESSIVE TS PACKET AND SEPARATE A NORMAL REPRODUCTION ECM AND SCRAMBLED CONTENT
S154
STORE THE SCRAMBLED CONTENT
S155
KEY CHANGING JUDGEMENT UNIT 1202 COUNTS THE TS PACKET INDEX AND CHECKS THE SCRAMBLING CONTROL FLAG
S156
IS IT THE TIMING FOR CHANGING BETWEEN SCRAMBLING KEYS?
S157
No
yes
KEY CHANGING JUDGEMENT UNIT 1202 PASSES THE TS PACKET INDEX TO THE SCRAMBLING KEY LIST GENERATION UNIT 1205
S158
ECM INTERPRETATION UNIT 1301 PASSES THE SCRAMBLING KEY THAT HAS BEEN USED UNTIL NOW AND THE SCRAMBLING KEY THAT WILL BE USED FROM NOW ON TO THE SCRAMBLING KEY LIST GENERATION UNIT 1205
S159
SCRAMBLING KEY LIST GENERATION UNIT 1205 UPDATES THE SCRAMBLING KEY LIST
S1510
ARE THESE NORMAL REPRODUCTION ECMS THE SAME WITH EACH OTHER?
S1511
yes
No
OVERWRITE THE STORED NORMAL REPRODUCTION ECM WITH NEW NORMAL REPRODUCTION ECM
S1512
KEY CHANGING JUDGEMENT UNIT 1202 PASSES THE TS PACKET INDEX TO THE SCRAMBLING KEY LIST GENERATION UNIT 1205
S1513
SCRAMBLING KEY LIST GENERATION UNIT 1205 COMPLETES THE SCRAMBLING KEY LIST
S1514
HOLD THE GENERATED SCRAMBLING KEY LIST
S1515
END

FIG. 44

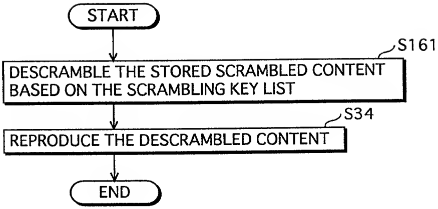

START
S161
DESCRAMBLE THE STORED SCRAMBLED CONTENT BASED ON THE SCRAMBLING KEY LIST
S34
REPRODUCE THE DESCRAMBLED CONTENT
END

FIG. 45

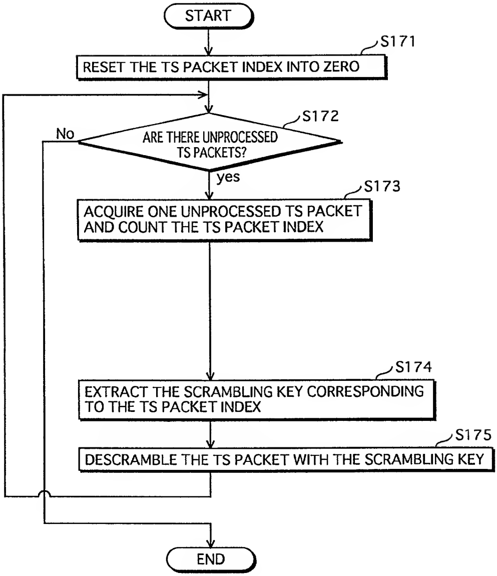

START
S171
RESET THE TS PACKET INDEX INTO ZERO
S172
ARE THERE UNPROCESSED TS PACKETS?
No
yes
S173
ACQUIRE ONE UNPROCESSED TS PACKET AND COUNT THE TS PACKET INDEX
S174
EXTRACT THE SCRAMBLING KEY CORRESPONDING TO THE TS PACKET INDEX
S175
DESCRAMBLE THE TS PACKET WITH THE SCRAMBLING KEY
END

FIG. 46

DATA STRUCTURE OF I PICTURE LIST DESCRIPTOR

```
for(i=0; i <N; i++) {
    Ipic_id                      2 BYTES
    first_packet_position        2 BYTES
    last_packet_position         2 BYTES
}
```

Ipic_id : I PICTURE IDENTIFIER (TO IDENTIFY I PICTURES)

first_packet_position : THE FIRST PACKET POSITION OF THE I PICTURE
(THE NUMBER OF TS PACKETS COUNTED FROM THE BEGINNING OF THE FILE)

last_packet_position : THE LAST PACKET POSITION OF THE I PICTURE
(THE NUMBER OF TS PACKETS COUNTED FROM THE BEGINNING OF THE FILE)